

DECnet-RSX

Release Notes

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The *DECnet-RSX Release Notes* inform the user of updated information not included in the manual set. This information covers software and/or documentation errors or changes made late in the development cycle, plus installation and operation hints. This manual should be read first.

SUPERSESSION/UPDATE INFORMATION: This is a new manual.

OPERATING SYSTEM AND VERSION:

- RSX-11M V4.1
- RSX-11M-PLUS V2.1
- RSX-11S V4.1

SOFTWARE VERSION:

- DECnet-11M V4.0
- DECnet-11M-PLUS V2.0
- DECnet-11S V4.0

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MGTPEALL

Contents

	Page
1.0 Release Description	1
1.1 New Features	1
2.0 Reporting and Isolating Problems	2
2.1 Reporting a User Problem	2
2.2 Reporting a Documentation Problem	2
2.3 Investigating and Correcting Serious Errors	2
3.0 Documentation Errors	3
4.0 NETGEN Notes	3
4.1 Prerequisites.	3
4.2 Pregenerated M-PLUS Systems	4
4.2.1 System Selection	4
4.2.2 Processor Type in RSXMC.MAC	4
4.2.3 Start-up File Customization.	4
4.3 Device Questions	5
4.4 Post NETGEN Suggestions.	6
4.5 Abormal NETGEN Termination	6
4.6 RSX-11S Generation on VMS Hosts	6
5.0 Device Notes	7
5.1 DMC-11 Communications Devices	7
5.1.1 Parameter Selection Switches	7
5.1.2 DMCs on Switched Circuits.	8
5.2 DUP-11 and DU-11 Device Priority.	8
5.3 KMC-11 Communications Device.	8
5.3.1 Control of DUP-11	8
5.3.2 Control of DZ-11	8
5.4 DL-11 to DZ-11 Connections.	8
5.5 DMP and DMV Multipoint Controllers	9
5.6 Powerfail Recovery.	10
5.7 Error Counters.	10
5.8 Device CSRs for Down-line loaded Systems	10
6.0 System Notes	10
6.1 System Pool Usage.	10
6.2 Network Resource Problems	11
6.3 Powerfail Recovery.	12
6.4 Using the DLX Interface	12
6.5 Running SHUTUP.	12
6.6 DLL/DUM Data Base Changes	12
6.7 Down-line Loading for RSX-11S Systems	12

6.8	Bootstrap Support for Down-line System Loading	13
7.0	Utility Notes	13
7.1	NCP	13
7.2	VNP	13
7.3	NFT	14
7.4	FTS.	15
7.5	FAL.	15
7.6	MCM.	16
7.7	NFARs	18
7.8	RMT	18
	7.8.1 Use of RMT from Command Files	18
	7.8.2 Aborting RMT	18
7.9	NTDEMO.	19
8.0	Cross-system File Access Notes	19
8.1	DECnet-RSX File Transfer Capabilities	19
8.2	RMS-11 V2.0 File Access Capabilities	19
8.3	VAX/VMS V3.4 File Transfer Capabilities	20
8.4	RSTS DECnet/E V2.0 File Transfer Capabilities	21
8.5	RT-11 DECnet V2.0 File Transfer Capabilities	21
8.6	TOPS-20 DECnet File Transfer Capabilities	22
8.7	TOPS-10 DECnet V1.0 File Transfer Capabilities	23
9.0	Unsupported Software	23
9.1	CEDUMP - Communication Executive Data Base Dump Program	24
	9.1.1 CEDUMP Switches.	24
	9.1.2 Building CEDUMP.	25
9.2	RVT	25
9.3	RST	25

1.0 Release Description

This is the DECnet-RSX Release for RSX-11M/S V4.1 and RSX-11M-PLUS V2.1. This release supports the DNA Phase IV Architecture, in particular, Ethernet communications, and the DEUNA/DEQNA device controller.

NOTE

This kit can be generated and run only on RSX-11M V4.1, RSX-11M-PLUS V2.1, or VMS V3.4 (with special patches) systems.

DECnet and PSI kits distributed on magnetic tape or RL01s contain identical NET kits. Therefore, users who have ordered both DECNet and PSI software will receive two NET kits, either of which can be used.

1.1 New Features

Major new features are:

- Ethernet and DEUNA support
- DNA Phase IV routing
- Support for pregenerated M-PLUS end node kits
- DLX Ethernet support, including multicast and broadcast options
- Streamlined NETGEN procedures
- Standard function network NETGEN option
- Multi-copy FAL support for M-PLUS systems
- NCP support for controller loopback diagnostic on DEUNA, DMC, DMR, DMP, and DMV devices
- Down-line load support for server systems
- New NFT features
- New NFARs features
- Additional NTD features

2.0 Reporting and Isolating Problems

2.1 Reporting a User Problem

When completing a Software Performance Report (SPR), describe one problem per report. This simplifies record keeping and facilitates a quick response.

User problems are often difficult to reproduce. Therefore, please describe the system state when the problem occurred. Keep the description simple yet accurate. Illustrate a general problem with several examples. When an SPR contains concise information about a problem, that problem is more likely to be reproduced and corrected. Please ensure that questions are direct and simply stated so they can be answered clearly and directly.

2.2 Reporting a Documentation Problem

When describing a problem in a manual, specify the full title of the manual and identify the appropriate section, table, and/or page number. Describe what the manual says and also describe the suggested correction.

2.3 Investigating and Correcting Serious Errors

This section contains information that should be used for both isolating problems and reporting problems to Digital.

To investigate and correct problems such as system hangs or crashes, the following information is essential:

- A description of the events leading up to the problem
- A machine-readable copy of:
 - Crash dump file
 - CEX symbol table file (CEX.STB)
 - Console dialog or output, if appropriate
 - CEX data base file (CETAB.MAC)
 - Any user task involved (source copy)
 - Task build command files or parameters used at NETGEN for the appropriate network tasks involved
 - Task build map files created during NETGEN for the appropriate network tasks involved
- The modem or type of local connection being used, (if the problem is device related)
- Suggestions for problem isolation

All media sent to Digital will be returned to the sender.

If the problem occurs when the network is running and software that does not use the network is involved, unload the network software. Then, try to reproduce the problem without network software.

If the problem occurs during periods of high interrupt loading, try to reproduce the problem without the load. Examples of high interrupt loading include many active high-speed communications lines, many active terminals, and any process I/O.

When reporting file transfer or file access problems, please include a DAP trace of the situation. See the sections on NFT, NFARs and FAL for information on creating DAP traces.

If you are experiencing device errors, the following items may be helpful in isolating and reporting problems:

- Using DTS/DTR while varying the message size
- Including a copy of the device's line and circuit counters

3.0 Documentation Errors

This section describes information that is documented incorrectly in the DECnet-RSX V4.0/2.0 manual set.

The *DECnet-RSX Programmer's Reference Manual* incorrectly documents the octal and decimal values for the IE.TMO completion status for the DLX QIO code, IO.XRC. This error can be found on page 4-19 of the manual. The correct values for the IE.TMO (timeout condition) status return are:

177641
IE.TMO
(-95.)

You should note, however, that your programs should reference symbolics for error codes, not numerical values.

4.0 NETGEN Notes

Many NETGEN questions have been eliminated and replaced with defaults. In most cases, the parameters that are set up by these defaults can be changed with CFE or NCP commands. If a parameter that you want to change can not be changed with CFE or NCP, then, prior to doing your NETGEN, you must change the parameter file that NETGEN uses. The parameter file [37,10]DECPRM.CMD can be found on the NETGEN disk.

On RSX-11M/M-PLUS systems, the slow task builder is required for NETGEN to build the network task loader (NTL). Also, NETGEN will not function properly if you use the small indirect command processor.

4.1 Prerequisites

This release of DECnet-RSX can be generated and run only on RSX-11M V4.1 and RSX-11M-PLUS V2.1 systems. The NETGEN will not function properly with earlier versions of the RSX systems.

4.2 Pregenerated M-PLUS Systems

4.2.1 System Selection

There are two system images on the RSX-11M-PLUS preSYSGENed distribution kit. Before doing a full NETGEN, you should use the procedure provided with the RSX-11M-PLUS distribution kit to delete the system that you will not be using. If you do not use the procedure provided, there may be some unwanted libraries left on your target disk and NETGEN may give you the option of using them, (for example, supervisor mode FCS or supervisor mode RMS libraries).

4.2.2 Processor Type In RSXMC.MAC

The processor type symbol may be incorrect for RSX-11M-PLUS systems that have been preSYSGENed. This is because the system may have been configured to run on one of several different types of processor. Therefore, before performing a NETGEN for a preSYSGENed RSX-11M-PLUS system, examine RSXMC.MAC to ensure that the processor type definition is correct. The symbol R\$\$TPR controls the processor type and should be set as follows:

```
R$$TPR="nn      ;Processor type
```

Where

nn is the two character processor type value.

Example:

```
R$$TPR="23      ;Processor type is PDP-11/23
R$$TPR="24      ;Processor type is PDP-11/24
R$$TPR="44      ;Processor type is PDP-11/44
R$$TPR="70      ;Processor type is PDP-11/70
```

4.2.3 Start-up File Customization

The RSX-11M-PLUS pregened systems now come with a start-up file that will deallocate the Communications Executive (CEX) space in the executive, unless the file LB:[1,2]SYSPARAM.DAT is modified. You must change the appropriate line in SYSPARAM.DAT from DECNET=NO to DECNET=YES and reboot the system before you can load your network software.

The start-up file will then display:

```
Step 2 - Deallocating DECnet communications executive
          System configuration includes DECnet
```

The second line of the above display indicates that the CEX space has not been deallocated.

The startup file will automatically configure all the devices on your system so that they are used by the executive and not by the network. You may want to use an asynchronous device (DZ, DZV, DL, or DLV) for network communications. To do so, you should either modify the LB:[1,2]SYSPARAM.DAT file or use the appropriate RSX-11M-PLUS reconfiguration command (see Chapter 15 of the *RSX-11M/M-PLUS System Management Guide*).

4.3 Device Questions

If you have specified a device that requires software CRC calculations and your system has a KG-11, you may want to use it on processors other than 11/70s and 11/44s. On 11/70s and 11/44s, selecting the KG-11 will reduce your throughput below that of the fast CRC routine. The fast CRC routine is the default from NETGEN.

NETGEN question 4.01 asks about the line speed for the device. The speed of a synchronous line is determined by the modem. The line speed specified in NETGEN is used to calculate timing criteria for the line and buffer requirements. If the specified line speed is incorrect, the timing will be incorrect and the large data buffer allocation may be incorrect. If the specified line speed is higher than the actual line speed, there may be errors on large data blocks or allocation failures of large data buffers. The errors on large data blocks will usually appear as data CRC errors. If the actual line speed is higher than the specified line speed, there is a long delay on timeouts. Use CFE to reset the specified line speed if the modem speed is changed.

NETGEN question 4.02 asks if the device is a DL11-WA. You should answer this question YES if your DL11 or DLV11 is any one of the following:

- DL11-A
- DL11-B
- DL11-C
- DL11-D
- DL11-WA
- DL11-WB
- DLV11-F
- DLV11-J

NETGEN questions 4.05 and 4.06 (in NET section 3) ask about modem signal monitoring and whether or not the modem switches carrier with Request to Send (RTS). Bell 202 modems (or their equivalents) do this. If the device is a DL11-E or a DLV11-E and the modem switches carrier with RTS, you should answer NO to question 4.05. Answering YES would require the monitoring of Data Set Ready (DSR), and this signal is not available from the DL or DLV devices. If the modem does not switch carrier (such as the Bell 103 or Bell 113), answer YES to question 4.05, since carrier (CAR) will be monitored and this signal is available from the DL or DLV device.

If questions 4.05 and 4.06 are both answered YES for a DL or DLV device, NETGEN will reset the answers to NO automatically.

4.4 Post NETGEN Suggestions

Before bringing up your network with NETINS.CMD, set the network UIC. For RSX-11M/M-PLUS systems, use the VMR or MCR command "SET /NETUIC=[x,54]". If you set the wrong network UIC, NETINS.CMD will use that UIC and may load the wrong network.

NETREM.CMD is a command file generated by NETGEN to help you unload the network and remove network tasks. NETREM.CMD is intended for use with V4.0/2.0 networks. NETREM.CMD unloads the HT: device but not the HT:'s UCB. Therefore, subsequent reloads are restricted to a network with the same number of HT:s. In order to load a network with a different number of HT:s, you must re-boot the system.

4.5 Abormal NETGEN Termination

If NETGEN terminates abnormally with an AT. error message (such as ...AT. — File read error) or if it simply stops prematurely with an end-of-file (@<EOF>) on the command file, the indirect command file processor (AT.) has most likely encountered a disk error. Restarting NETGEN from the beginning and using a different disk drive may alleviate the problem.

4.6 RSX-11S Generation on VMS Hosts

The VMS V3.4 release does not support all of the features necessary to perform a DECnet-11S network generation. Therefore, you must follow the procedure outlined below:

- You must be logged into your VMS system under an account that has MCR as the default CLI.
- Before running NETGEN, you must have the following privileges:
 - **BYPASS** Access resources without regard to UIC protection. Allows NETGEN to do file operations wherever necessary.
 - **CMKRNL** Change mode to Kernal. Allows NETGEN to use the SET /UIC MCR command.
 - **SYSNAM** Enter name in system logical name table. Allows NETGEN to use ASN/GLOBAL MCR command.
- The following assignments must be made:
 - >ASN *ddnn*: [200,10] NETUSR.EXE RSXUSR
 - >ASN *ddnn*: [200,10] ICM.EXE ICM

Where

ddnn is the disk drive containing the NETGEN disk.

- The following assignments must be made with the /GLOBAL switch:

```
>ASN/GLOBAL dduu:=LB:
>ASN/GLOBAL dduu:=OU:
>ASN/GLOBAL dduu:=OU0:
>ASN/GLOBAL ddll:=LS:
>ASN/GLOBAL ddll:=MP:
>ASN/GLOBAL ddii:=IN:
>ASN/GLOBAL ddii:=IN0:
```

Where

dduu is the target device.
ddll is the device where listings are placed.
ddii is the NETGEN input device.

These assignments are made in the SYSTEM logical assignment table and may affect other users on the VMS system.

- You can now invoke the NETGEN procedure that was distributed with your DECnet-11M/S distribution kit. Use the following command:

```
>ICM @dduu:[137,10]NETGEN.CMD
```

- The following should be noted:
 - The PAUSE option at the end of each NETGEN section should not be attempted. It leads to unpredictable results on a VMS system.
 - During execution, VMS will output harmless messages that make the listing difficult to read. The messages are similar to:

```
! 'F$VERIFY(0)'
SET /UIC=[1,1]
$STOP/ID=0
```

5.0 Device Notes

5.1 DMC-11 Communications Devices

5.1.1 Parameter Selection Switches

Switch pack S2 on the M8201 or M8202 controls the password code for comparison with an incoming remote load detect message. To disable the remote load detect feature, all of these switches must be turned off.

Switch pack S3 corresponds to the 8 low-order bits of the M9301 starting address. The setting to down-line load over the DMC-11 using the M9301-YJ is 356 (octal) for the first DMC-11 and 374 (octal) for the second DMC-11.

The DMC-11 must be installed in the proper location in floating address space for the M9301 to operate.

For information on the requirements and switch settings for the M9312, refer to the *M9312 Bootstrap-Terminator Module Technical Manual*.

5.1.2 DMCs on Switched Circuits

The DMC-11 asserts DTR (Data Terminal Ready) after each system boot. If the DMC is connected to a modem for Data Phone Digital Service (DDS switched circuit), the modem autoanswers as long as DTR is asserted. However, when a DMC-11 line is set to the OFF state with NCP, the DMC clears the DTR. To prevent the modem from autoanswering before the line is set to the ON state, enter the following commands:

```
>NCP SET CIRCUIT DMC-x STATE ON  
>NCP SET CIRCUIT DMC-x STATE OFF
```

Where

x is the DMC controller number.

5.2 DUP-11 and DU-11 Device Priority

The DUP-11 or DU-11 should be installed at priority 6. Installing these devices at priority 5 can cause underrun and overrun errors on systems with high interrupt loads at or above priority 5.

It should be noted that although these devices are installed at priority 6, the software device drivers run at a different priority. The software device drivers run at priority 5 when servicing buffer completions and at priority 7 while actively transmitting or receiving. This allows the receiver to interrupt transmit completion processing and the transmitter to interrupt receiver completion processing.

5.3 KMC-11 Communications Device

5.3.1 Control of DUP-11

To operate DUP-11DA devices under the control of the KMC-11, the devices must be revision J or later.

5.3.2 Control of DZ-11

To use the DZ-11A, B, or E with the KMC-11, the DZ-11 must be no lower than revision F. A DZ-11C, D, or F must be no lower than revision C.

5.4 DL-11 to DZ-11 Connections

Connections between DL-11Cs and DZ-11C, D, or Fs must use an H319 20-milliamp current loop receiver (optical isolator).

5.5 DMP and DMV Multipoint Controllers

If you are using a DMP or DMV device as a multipoint controller, you must set the DEAD TIMER and DELAY TIMER parameter values properly. If these parameters are not set properly, the performance of the line may be degraded. For a complete description of these parameters see the *DMP11 Synchronous Controller Technical Manual* or the *DMV11 Synchronous Controller Technical Manual*.

Set the DEAD TIMER parameter using the following NCP commands:

```
>NCP SET LINE DMP-cnt DEAD TIMER msc  
>NCP SET LINE DMV-cnt DEAD TIMER msc
```

Where

cnt is the controller number.

msc is the dead timer parameter value in milliseconds.

NOTE

Initially, set the DEAD TIMER parameter to a value midway between 5,000 and 30,000; then adjust the rate to suit your network. If there are no problems with this set rate, you may want to set a higher rate to maximize performance.

Set the DELAY TIMER parameter using the following NCP command:

```
>NCP SET LINE DMP-cnt DELAY TIMER msc  
>NCP SET LINE DMV-cnt DELAY TIMER msc
```

Where

cnt is the controller number.

msc is any one of the following delay timer parameter values (in milliseconds):

- 0 for lines with speeds equal to or greater than 56Kb
- 50 for multipoint EIA lines with speeds up to 19.2Kb
- 200 if any DDCMP software implementations are on the line

NOTE

Always choose the larger value if more than one could apply.

You should also note that dead tributaries are always polled if they are in an ON state. If any tributaries are known to be in a dead state (either permanently or temporarily) for some significant amount of time, they should be turned off. This can improve performance for the tributaries that are on. To do this, use the following command:

```
>NCP SET CIRCUIT DMP-cnt.tri STATE OFF
```

Where

cnt is the controller number.

tri is the tributary number.

5.6 Powerfall Recovery

If a power failure occurred while any DMC-11 line was active, there is a possibility that the DMC can corrupt memory before the network software is aware of the recovery. This situation can cause the system to crash.

5.7 Error Counters

If a header CRC error occurs as a result of line interference, the Header Format Error and Buffer Too Small error counter flags may be incremented instead of the Header CRC Error. This is a result of the device drivers checking these conditions before calculating the header CRC.

5.8 Device CSRs for Down-line loaded Systems

It is important to have the "floating" device CSRs at the proper addresses on the system to be loaded. The proper addresses are determined according to the standard UNIBUS ranking of the devices, as when setting up the CSRs for a system that auto-configures to determine the devices on the system.

A command file, [200,200]FLOAT.CMD, is provided to help you determine the CSR addresses. This file is on the DECnet distribution kit.

6.0 System Notes

6.1 System Pool Usage

The installation and operation of DECnet software can add significantly to the system pool usage, depending on user requirements. To help in minimizing the system pool usage, a general breakdown of pool requirements for various DECnet features is given below.

Installing a task on an RSX-11M V4.1 or an RSX-11S V4.1 or later system takes about 24,000 words of pool, (depending on the exact executive configuration). From 6 to 30 DECnet-supplied tasks can be installed in an operational

system. The *Overview to DECnet-RSX* describes the functions of the network components. If you have limited pool, you may want to install only some of the network tasks and/or remove the loading tasks after the network is loaded.

Network parameters that use pool include:

- | | |
|---|---|
| • Number of control buffers | 17. words/control buffer |
| • Incoming network
command terminal
links | 30. words/allowed link
for HT: driver data
structures |
| • Maximum logical
links allowed | 2. words/allowed link |
| • Number of
circuits defined | 21. words/circuit |

Loading and starting the network can use a wide range of values of system pool, depending on your specific system configuration. During network load and start-up, control buffers and common areas for DECnet processes are allocated.

When running network tasks, the first logical link adds 18. words to pool usage and each additional logical link adds 11. words. (This does not include the pool required for any QIOs issued on the logical unit.)

6.2 Network Resource Problems

When running your system, periodically check the system counters using the NCP SHOW SYSTEM COUNTERS command.

In many cases of apparent network problems, the difficulty can be traced to insufficient network resources. If there are receive buffer allocation failures, increase the minimum number of receive buffers with the CFE DEFINE SYSTEM MINIMUM RECEIVE BUFFERS command. Increasing the minimum number of receive buffers effectively decreases the number of large buffers that can be used for transit messages. Therefore, you may need to increase the number of large buffers. Use the CFE SET SYSTEM MAXIMUM LARGE BUFFER command to increase the number of large buffers.

If there are large buffer allocation failures, increase the number of large buffers with the CFE DEFINE SYSTEM MAXIMUM LARGE BUFFER command. Alternately, you can decrease the minimum number of receive buffers with the CFE DEFINE SYSTEM MINIMUM RECEIVE BUFFER command, since this will effectively increase the number of large buffers that can be used for transit messages. If you do this, however, watch for receive buffer allocation failures.

For further information involving receive buffer and large buffer allocation failures, see Chapter 5 of the *DECnet-RSX System Manager's Guide*.

6.3 Powerfall Recovery

If a power failure occurs, logical links may be aborted and switched lines are disconnected. The circuits are restarted upon recovery.

6.4 Using the DLX Interface

The DLX interface supports tasks with external headers on RSX-11M-PLUS systems.

6.5 Running SHUTUP

The Shutup procedures used under RSX-11M and RSX-11M-PLUS correctly dismount the network during the dismount phase. If you wish to clear the network from memory during Shutup, include the following information in LB:[1,2]SHUTUP.CMD:

```
NCP SET EXECUTOR STATE OFF
.WAIT NETACP
NCP CLEAR SYSTEM
```

Because the NCP SET EXECUTOR STATE OFF command completes asynchronously, immediate issuance of an NCP CLEAR SYSTEM command causes the following error message to be displayed:

```
NTL -- Device NS: Still Active
```

To avoid this, .WAIT NETACP must be included in SHUTUP.CMD.

6.6 DLL/DUM Data Base Changes

Use the CFE DEFINE NODE command to set up the down-line load and up-line dump data base.

6.7 Down-line Loading for RSX-11S Systems

When down-line loading an RSX-11S system from a multi-point master to a system with a DMP/DMV tributary, the tributary address must be set in the switches on the DMP/DMV device on the target system. Once the software is down-line loaded, it will continue to use the tributary address that was set in the switches on the device. This allows you to down-line load the same image into many tributaries and have them retain their unique tributary address. If you want the down-line loaded software to override the tributary address on the device, then prior to NETGEN, change the \$DOVER flag in the [137,10]DECPRM.CMD file, located on your NETGEN disk.

6.8 Bootstrap Support for Down-line System Loading

	Remote Load Detect	Power-on Boot	Console Boot
DMP11	(1)	(1)	N/A
DMV11	(1)	(1)	N/A
DEUNA	(1)	(1)	(2)
DMC11	(3)	(3)	(3)
DMR11	(3)	(3)	(3)
DL11-E	N/A	(3)	(3)
DU11	N/A	(3)	(3)
DUP11	N/A	(3)	(3)
DLV11-E/F	N/A	(4)	(4)
DUV11	N/A	(4)	(4)

-
- (1) Device configuration (switch settings) required
(2) M9312 required
(3) M9301 or M9312 required
(4) BDV11 required
N/A Not available

7.0 Utility Notes

7.1 NCP

There is no way to specify a null password or any other null string quantity with NCP.

7.2 VNP

VNP has the following restrictions:

- TOP loading of processes is not supported.
- Loading network processes into a 22-bit system image file that is above 124 KW is supported on RSX-11S systems only.
- RSX-11M system images must be saved using the RSX SAVE command before the network is loaded with VNP.

7.3 NFT

There are major changes to NFT in this release. These changes include:

- Version number conversion
- Wildcards allowed in output filespecs
- Automatic Block mode selection (/AX,/BK,/RC)
- Filespec logging switch (/LO)
- File attributes directory switch (/AT)

See the *DECnet-RSX Guide to User Utilities* for detailed descriptions of these functions.

NFT now implements parsing and merging of the output filespec after opening the input file. This allows wildcards to be specified in the output filespec as well as new version number features.

When transferring to or from a VMS system, NFT will automatically convert the version number on the output filespec to the correct radix for the destination file system. However, explicit version numbers on input or output filespecs will not be converted.

Because this is an NFT feature, you may still have problems with decimal version numbers when copying files from VMS systems to RSX systems. You can avoid this problem by always using the following command format when copying from a VMS node:

```
COPY *.* rsxnode::*.*;0
```

NFT will now try to use Block mode file transfer to RMS FALs (VMS, RSX, RSTS) by default. This may cause subtle problems since RMS-11 allows block mode access to unit record devices. Therefore, transfers to terminals or line printers may not have the proper carriage control. You can override the default with the new Record mode switch (/RC).

When reporting problems with NFT, a DAP message trace of your particular problem will help isolate the problem quickly. Please submit trace output with any NFT related SPR. NFT must be rebuilt to enable message tracing.

To add trace support, modify [137,24]DECPRM.CMD to change \$DNFTR to true and rebuild NFT using the NETGEN component mode.

To activate tracing, assign the TR: logical device name to the desired trace, using the ASN *ddn:=TR:* command.

If the trace output device is a disk, the output will be placed in the NFARS.TRC file under the current UFD.

7.4 FTS

The FTQ task no longer controls the FTS queue. The appropriate commands to initialize and start the FTS queues are included in [x.1]NETINS.CMD.

There is a known problem with "killing" FTS job entries held by the queue manager. Killing a job entry involves sending a message to the queue manager to kill the queue entry and deleting the user request file which defines the job to FTSDEQ. When the FTS /KI command is issued, FTS attempts to delete the user request file and to send a request to the queue manager to kill the queue entry. If the request has not been requeued by FTSDEQ due to some failure, the kill request will work. However, when a job has been requeued by FTSDEQ, the queue request is entered under the owner UIC [1,1]. FTS can no longer request the queue manager to kill the queue entry because the queue entry is now owned by [1,1] and not by the original user. FTS may still delete the user request file.

If the queue entry is not in the HELD state and the user request file has been deleted, the entry is deleted the next time FTSDEQ is invoked. However, if the queue entry has been placed in the "HELD" state, the entry must be killed by a privileged user running under the UIC [1,1]. To kill the queue entry, issue the queue manager command

```
QUE /DEL/EN:entry
```

7.5 FAL

There are two versions of FAL available. One version supports basic FCS sequential file access and can be subsetting for use on RSX-11S nodes. The other version supports RMS-11 file access.

The RMS based FAL has been updated to use RMS-11 V2.0 exclusively. The RMS based FAL is now the default on RSX-11M-PLUS systems and is built as a multi-copy, multi-user task with resident RMS-11 support. The network manager can control the number of concurrent file accesses with NCP or CFE by setting the number of copies allowed for the FAL object. (VMS wildcard operations use two copies of FAL.)

On RSX-11M systems, FAL is a single copy object and the FCS-11 based FAL is still offered as an option.

On RSX-11S systems, you can use only the FCS FAL subsetting to run with FCS-11S which allows access to unit record devices.

The FCS-11 based FAL does not support random record access, relative or indexed files, stream files, and VFC files with fixed record headers whose header length is not equal to 2. It also does not support the rename, change protection, or block mode transfer features of NFT.

You must have RMS-11 V2.0 installed on your target system in order to support the the RMS option for FAL. If you do not choose the RMS support option for FAL, the NFT rename, change protection, and block mode transfer features will not work when executed against your system.

NOTE

RMS-11 V2.0 installs differently than RMS-11 V1.8. Make sure you install RMS according to the commands in the system start-up file provided by Digital.

FAL allows network file access to occur only to or from public devices. If a device is to be accessed by a remote user, using either NFT, FTS, or any task which is linked to the NFARs, then the device must be made public using the MCR SET /PUB=ddu: command before the disk is mounted. Note that mag-tapes can be set public but must be mounted for use by a single user. Since FAL cannot mount the tape, magtapes cannot be accessed by FAL.

FAL has the ability to provide logging of file accesses. To enable logging, you must provide the empty file LB:[1.4]FAL.LOG. An entry will be appended to FAL.LOG for each file access request. The system manager should make sure that the file is "emptied" often enough that it does not grow too large.

When reporting problems with FAL or NFT, a DAP message trace of your particular problem will help to isolate the problem quickly. Please submit trace output with any FAL related SPR. FAL must be rebuilt to enable message tracing.

To add trace support, modify [137,24]DECPRM.CMD to change \$DFLTR to true and rebuild FAL using the NETGEN component mode.

To activate tracing, assign the FT: logical device name to the desired trace, using the ASN ddn:=FT:/TERM=CO: command.

If the trace output device is a disk, the output will be placed in the file [1.4]FAL.TRC.

7.6 MCM

The MCM utility submits command files for execution by invoking either the indirect command file processor or the batch file processor. Only one type of submission is supported by MCM. The type of submission is a generation option.

If command files are to be submitted to the indirect command file processor (...AT.), MCM initiates the processing by executing a command line at a specified terminal. The default is TT0:. This default may be changed by either of two methods:

- Reassigning LUN 1 of MCM, which is installed with the .CMTS. task name
- Editing the [x,24]MCMBLD.CMD file, changing the appropriate ASG option, and then rebuilding the MCM task using the following commands:

```
SET /UIC=[x,24]
ASN aau:=IN:
ASN bbu:=OU:
ASN ccu:=MP:
ASN ddu:=LB:
TKB @MCMBLD
```

Where:

- x is the group code for the network UIC.
- aau: is the DECnet object disk, as output from PREGEN.
- bbu: is the output disk, where the network tasks reside.
- ccu: is the map disk, where the network maps reside.
- ddu: is the library disk, where the system files reside.

NOTE

On systems which support multi-user protection, the specified terminal must be logged on for MCR to accept the commands. Since the system and file access privileges will be determined by the account used to log on the terminal, a non-privileged account should be used for logging on. Otherwise, any network user could execute privileged commands.

The tasks MCM and AT. cannot be permitted to checkpoint each other. Therefore, these tasks should never be installed in the same partition unless it is a large, system-controlled partition. Because of MCM's small task size, you might consider installing this task in the SYSPAR partition.

7.7 NFARs

There are major changes to the NFARs in this release. These changes include record access and extended attributes support. Most of the new features for NFARS are detailed in the *DECnet-RSX Programmer's Reference Manual*, however, the following information represents changes that are not documented in that manual.

The ACONFW and ATTNFW calls include a status block as the second argument.

The following are the new argument lists:

ACONFW (lun,status,fac,shr,fop,accopt)

ATTNFW (lun,status,namesize,name,atb,protblk,owner,dateblk)

The *dateblk* argument on ATTNFW has been changed to include the *datemenu* as an additional word at the beginning.

Additionally, the CLSNFW call has been changed to include a new *fop* argument. The *fop* specified on the ACONFW call will not be used. You must specify an *fop* on the CLSNFW call if you want to use *fop* options on close, as shown in the following example:

CLSNFW (lun,status,changearg,fop)

You may wish to use the DAP trace module to debug user programs that use the NFARs. To add trace support, explicitly include in the task image the NFATRC module from the DAPTRC object library. The reference to NFATRC must come before any references to the DAPFOR library in the task build command file.

To activate tracing, assign the TR: logical device name to the desired trace device. If the trace output device is a disk, the output will be placed in the file "NFARS.TRC" under the current UFD.

7.8 RMT

7.8.1 Use of RMT from Command Files

It is recommended that you do not invoke the RMT utility from an indirect command file or from a batch job. The results are unpredictable and depend heavily upon the system and the timing involved.

7.8.2 Aborting RMT

On DECnet-11M-PLUS systems, the Remote Terminal task (RMTACP) is made abortable through an Executive feature. Since this feature does not exist on RSX-11M or RSX-11S, it is possible for a privileged user to abort the task while it is in use. If RMTACP or any other privileged task is aborted, the system data structures may be left corrupted.

If such an abort occurs, the users that are connected through RMT can enter a "garbage" line. This line causes RMTACP to be invoked again and resets their terminals to the original state.

If RMTACP is aborted, it should not be removed from the system until all terminals are reconnected to the local system. Premature removal of RMTACP after an abort may lead to a system crash.

7.9 NTDEMO

NTDEMO has been expanded into two displays for managing large networks. There is a new format for the default resource display and a new remote node display.

In the node resource display, the circuits are displayed in NETGEN device selection order and are those currently owned by DECnet transport. (Circuits in service states will not be shown.) If a circuit is an Ethernet channel, then the adjacent node displayed is the current designated router.

The remote node display includes filtering parameters that allow you to specify the range of nodes displayed.

NTD automatically checks the version on the remote RSX system. If the remote system does not support the new features, NTD will use the old display format.

See Chapter 11 of the *DECnet-RSX System Manager's Guide* or the HELP screen in NTD for details.

8.0 Cross-system File Access Notes

This section describes some general capabilities of the DECnet file transfer utilities and some specific considerations for file transfer between different Digital operating systems.

8.1 DECnet-RSX File Transfer Capabilities

Support of the DAP Rename operation is limited to the RSX-11M/M-PLUS NFT and RMS-11 based FAL utilities.

Support of the DAP Change Protection operation is limited to the RSX-11M/M-PLUS NFT utility and the RSX-11M/M-PLUS and VMS RMS based FAL utilities.

Neither the RMS-11 nor the FCS-11 based RSX-11M/M-PLUS FALs support the FOP delete-on-close option bit in combination with the spool-on-close option. If this bit is set, it will be ignored, and the file will be spooled but not deleted.

8.2 RMS-11 V2.0 File Access Capabilities

RMS-11 V2.0 supports transparent remote file access to RMS based FALs. However, programs using RMS-11 must be linked with remote support and must adhere to imposed restrictions. For more information see Appendix B of the *RSX-11M/M-PLUS RMS-11 Users's Guide*. The DECnet-RSX RMS FAL supports all of the functions provided by the RMS-11 V2.0 interface.

8.3 VAX/VMS V3.4 File Transfer Capabilities

VAX/VMS supports a transparent remote file access interface integrated with the RMS file system. For more information see the VAX/VMS VAX-11 RMS manuals and the *VAX/VMS Cross System Notes*. The VMS FAL supports most of the capabilities of VAX-11 RMS.

There are problems with wildcard transfers from VAX/VMS to RSX-11M/M-PLUS nodes due to the use of decimal file version numbers on VMS and octal file version numbers on RSX. See the previous NFT section for details.

VMS batch log files and files created by VMS DCL default to print file carriage control. Although this is now a supported record format for RSX-11M/M-PLUS, it is not understood by many RSX text editors and utilities. Therefore, you should be careful when transferring files from a VMS system to an RSX system. If the file is to be used on the RSX system, it may have to be converted by the RMS Convert utility.

VMS RMS supports three types of Stream format files:

- Normal Stream format (RFM=FB\$STM)
- Stream-CR (FB\$SCR)
- Stream-LF (FB\$SLF)

All stream formats may be transferred in ASCII record mode (/AS) in order to be translated into variable format on RSX.

RSX-11M/M-PLUS and VAX/VMS have differing meanings for the E protection category. On RSX, E means extend file access. On VMS, E means execute (run) file access. When transferring files to a VMS system, the extend protection setting is lost and execute access is allowed. When transferring from a VMS system, the execute protection setting is lost and extend access is allowed.

Space for VAX/VMS files are allocated according to the disk's cluster size. When transferring files from a VMS system to an RSX system using the VMS COPY command, the extra blocks allocated due to cluster round-up will not be truncated. When this happens, you may truncate the file on the RSX node using the PIP file/TR command. RSX task image files transferred from a VMS system must be truncated, because the INSTALL command on the RSX system will not install a file whose high block is not the same as the End-of-File block.

The VAX-11 RMS file system supports a superset of the RMS-11 V2.0 capabilities. Some of the capabilities are suppressed or modified by the VAX-11 RMS network access code when working against an RSX system and some are not. See the *VAX/VMS Cross System Notes* for more detail. The following capabilities or attributes are not supported by the RSX RMS-11 based FAL:

- Record access to Stream-CR or Stream-LF Record Format (RFM) types.
- The Contiguous-Best-Try Allocation option (*fop* or *aop* = CTB). VMS suppresses this option.
- Numerous *fop* options including Truncate-On-Close.
- Prologue version 3 indexed sequential files. You must use CONVERT to change the file to Prologue version 1 or 2.
- \$RELEASE and record locking: RMS-11 V2.0 only supports bucket level locking.

8.4 RSTS DECnet/E V2.0 File Transfer Capabilities

RSTS now supports an RMS-11 based FAL and NFT. For information on the RSTS DAP utilities, see the *DECnet/E Guide to User Utilities* and the *DECnet/E Release Notes*.

Most text files on RSTS systems are in Stream ASCII record format. This is a supported record format for the RSX-11M/M-PLUS RMS-11 based FAL, but not for many RSX text editors and utilities. Therefore, you should be careful when transferring files from a RSTS system to an RSX system. RSTS NFT will translate stream ASCII files into variable length record format if the /VA switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

RSTS NFT cannot copy sequential files that have an FFB value other than 0 or 512 in block mode from an RSX RMS-11 based FAL. RSTS RMS-11 currently restricts block I/O writes to units of 512 bytes. Such sequential files must be transferred in record mode.

The RSTS FAL supports only block mode transfer of indexed files.

8.5 RT-11 DECnet V2.0 File Transfer Capabilities

The RT-11 FAL supports only sequential files and a basic set of file operations. For more information see the *DECnet-RT Guide to User Utilities* and the *DECnet-RT Release Notes*.

Most text files on RT-11 systems are in Stream ASCII record format. This is a supported record format for the RSX-11M/M-PLUS RMS-11 based FAL, but not for many RSX text editors and utilities. Therefore, you should be careful when transferring files from an RT-11 system to an RSX system. RT-11 NFT will translate stream ASCII files into variable length record format if the /AS switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

The RT-11 FAL does not support:

- Relative and indexed file organizations
- Variable and VFC record formats
- Fortran and implied LF-CR record attributes

8.6 TOPS-20 DECnet File Transfer Capabilities

The TOPS-20 FAL supports only sequential files and a basic set of file operations. For more information see the *DECnet-20 Guide to User Utilities* and the *DECnet-20 Release Notes*.

Most text files on TOPS-20 systems are in Stream ASCII record format. This is a supported record format for the RSX-11M/M-PLUS RMS-11 based FAL, but not for many RSX text editors and utilities. Therefore, you should be careful when transferring files from a TOPS-20 system to an RSX system. TOPS-20 NFT will translate stream ASCII files into variable length record format if the /AS switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

For image mode transfers, NFT supports the /RAT:MACY11 switch which informs the TOPS-20 FAL that the file is for use on a PDP-11. This switch can be used on input or output files to specify that the file should be stored or retrieved as an MACY11 formatted file on the TOPS-20 system. The MACY11 attribute is not retained by TOPS-20 and must be specified when retrieving the file.

TOPS-20 does not support:

- Relative and indexed file organizations
- Fixed, variable and VFC record formats
- Fortran and implied LF-CR record attributes
- Random record and block I/O access modes

8.7 TOPS-10 DECnet V1.0 File Transfer Capabilities

The TOPS-10 FAL supports only sequential files and a basic set of file operations. For more information see the *DECnet-10 User's Guide* and the *DECnet-10 Release Notes*.

Most text files on TOPS-10 systems are in Stream ASCII record format. This is a supported record format for the RSX-11M/M-PLUS RMS-11 based FAL, but not for many RSX text editors and utilities. Therefore, you should be careful when transferring files from a TOPS-10 system to an RSX system. TOPS-10 NFT will translate stream ASCII files into variable length record format if the /AS switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

For image mode transfers, NFT supports the /RAT:MACY11 switch which informs the TOPS-10 FAL that the file is for use on a PDP-11. This switch can be used on input or output files to specify that the file should be stored or retrieved as an MACY11 formatted file on the TOPS-10 system. The MACY11 attribute is not retained by TOPS-10 and must be specified when retrieving the file.

TOPS-10 does not support:

- Relative and indexed file organizations
- Fixed, variable and VFC record formats (these formats will be accepted, but translated into a native representation)
- Fortran, implied LF-CR, and print record attributes. (these attributes will be accepted, but translated into a native representation)
- Random record and block I/O access modes

9.0 Unsupported Software

The UFD [200,200] located on the distribution media contains unsupported software provided by Digital as a courtesy to customers.

All unsupported software can be generated by invoking the file [200,200]UNSGEN.CMD located on the distribution disk.

9.1 CEDUMP – Communication Executive Data Base Dump Program

CEDUMP is an unsupported utility for displaying the internal data structures in formatted text.

9.1.1 CEDUMP Switches

CEDUMP functions are controlled by a number of switches. The switches are divided into four categories:

- **General Switches** – General switches consist of the following two switches provided for general use of all Comm/Exec based communications products:

/HE List the CEDUMP switch descriptors

The /HE switch lists of all the valid CEDUMP switches at the time that the /HE switch is invoked. For example, if DECnet is available but not currently active, the DECnet specific switches will not be listed.

/AL List all available data structures

The /AL switch lists all of the available data structures at the time that the switch is invoked. For example, if the Comm/Exec is not loaded, no data structures will be displayed.

- **Comm/Exec Specific Switches** – The basic network data structures for all products layered upon the Comm/Exec are displayed by the following switches:

/CM Display the Comm/Exec common data base

/FR Display the free resource list status

/LT Display the DLC/DDM process line tables and LLC data bases

/NL Display the network loader information

/PD Display the process descriptors

/PO Display the pool statistics

/RV Display the reverse mapping table

/SL Display the system line table

- **DECnet Specific Switches** – DECnet specific data structures are displayed by the following switches:

/DH Display the DECnet home block

/GE Display the DECnet general delivery queue

/IO Display the NETACP I/O queue

/LI Display the active line count

/LL Display the logical links

/LN Display the physical link blocks

/MB Display the DECnet mailbox queue

- **PSI Specific Switches** – The PSI specific data structures are displayed by the following switches:

/CG Display name blocks

/DS Display destinations

/LD Display local DTE descriptors

/PH Display PSI home block

/PV Display PVC name blocks

/RD Display remote DTE name blocks

/WB Display window blocks

/XC Display XCBs

/XM Display X25 mailboxes

/XG Display X25 general delivery queue

/XA Display X25ACP's I/O and CCB queues

9.1.2 Building CEDUMP

CEDUMP can be built for DECnet-11M/M-PLUS systems by invoking the UNSGEN.CMD command file. The file is located on the object kit in UIC [200,200].

9.2 RVT

RVT cannot be run under a terminal connected via RMT.

9.3 RST

RST has been renamed to RRS to avoid conflict with the RMS-11 Restore utility.

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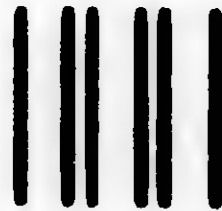
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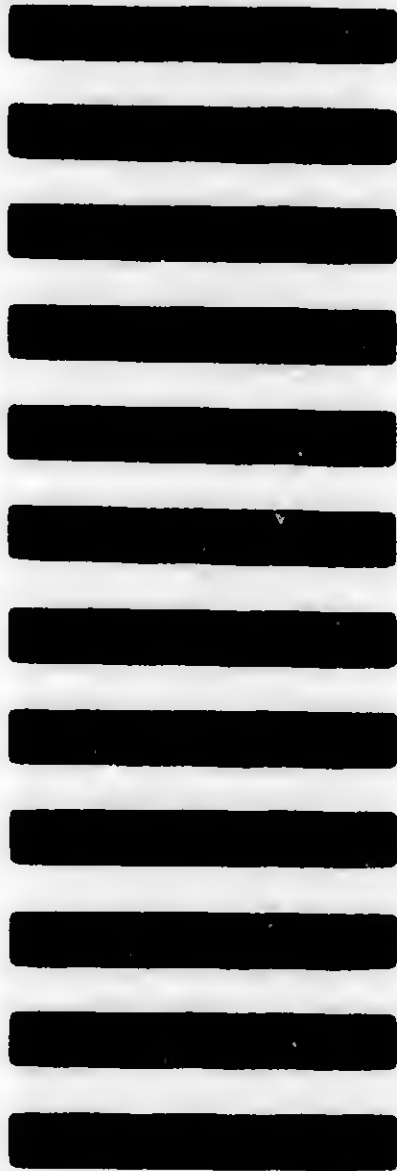
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Overview of DECnet-RSX

Order No. AA-M096B-TC

November 1983

The *Overview of DECnet-RSX* describes the features of DECnet as implemented on an RSX system.

SUPERSESSION/UPDATE INFORMATION: This is a revised manual.

OPERATING SYSTEM AND VERSION: RSX-11M V4.1
RSX-11M-PLUS V2.1
RSX-11S V4.1

SOFTWARE VERSION: DECnet-11M V4.0
DECnet-11M-PLUS V2.0
DECnet-11S V4.0

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CFE	Configuration File Editor
DAP	Data Access Protocol
DCP	Digital Communications Process
DDM	Device Driver Module
DLL	Down-line System Loader
DLM	Data Link Mapping
DLX	Direct Line Access
DUK	KMX Microcode Dumper
DUM	Up-line System Dumper
ECL	End Communication Layer and Driver
EPM	Ethernet Protocol Manager
EVC	Event Collector
EVL	Event Logger
EVR	Event Logging Receiver
FAL	File Access Listener
FCS	File Control Services
FTS	File Transfer Spooler
HLD	Host Task Loader
KDA	KMX Microcode Dump Analyzer
KMCL	KMC Microcode Loader
LAB	LAP-B Protocol Handler
LIN	Link Watcher
LOO	Loopback Tester
LSN	TLK Server Task
MCM	Command File/Batch File Submission Task
MIR	Loopback Mirror
MLD	General Microcode Loader
NCP	Network Control Program
NCT	Network Control Terminal Task
NDA	Network Crash Dump Analyzer
NETACP	Network ACP

- **Introduction to DECnet**

The *Introduction to DECnet* provides information on the concepts and capabilities of DECnet networks. It defines DECnet terms and describes the network functions that DECnet implementations provide.

- **DECnet-RSX Network Generation and Installation Guide**

The *DECnet-RSX Network Generation and Installation Guide* describes the procedures to be observed in generating and installing a DECnet node and generating and installing an RSX-11 PSI system on the same node.

This manual is intended for a system manager, an advanced user, or anyone responsible for generating and installing a new node and verifying that it is functioning correctly.

- **DECnet-RSX Postinstallation Checkout Procedures**

The *DECnet-RSX Postinstallation Checkout Procedures* defines procedures for verifying that a new node has been correctly installed and is operational. Verification is performed by testing the local software and hardware, and then by testing a link to a remote node.

This manual is intended for a system manager or anyone trained to perform the various installation checkout procedures.

- **DECnet-RSX System Manager's Guide**

The *DECnet-RSX System Manager's Guide* describes the system management utilities such as the Network Control Program (NCP), the Virtual Network Processor (VNP), and the Configuration File Editor (CFE). It also presents command formats and shows how they can be used to monitor and control network performance. This manual addresses both DECnet-RSX and DECnet-RSX/PSI users.

This manual is intended for a system manager who is responsible for maintaining DECnet-RSX nodes in the network. A system manager monitors network operation, starts up and brings down the network, and issues a wide range of network management commands that affect network operation. This manual describes the procedures to be observed in monitoring and controlling a DECnet node, and monitoring and controlling an RSX-11 PSI system on a DECnet node.

- **DECnet-RSX System Manager's Minireference Guide**

The *DECnet-RSX System Manager's Minireference Guide* provides a summary of system management commands and related information. It serves as a companion to the *DECnet-RSX System Manager's Guide*.

- **DECnet-RSX Guide to User Utilities**

The *DECnet-RSX Guide to User Utilities* describes the terminal utilities that DECnet-RSX provides. These utilities include the Network File Transfer (NFT) utility, the File Transfer Spooler (FTS) utility, the Terminal Communication (TLK) utility, and the Remote Terminal (RMT) utility.